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Portland State University. Criminology and Criminal Justice Senior Capstone, "Predictive Policing: A Review of the Literature" (2012). *Criminology and Criminal Justice Senior Capstone Project*. Paper 5.
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Predictive Policing

A Review of the Literature

Portland State University, Summer 2012

Criminology and Criminal Justice Senior Capstone Class:

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Introduction

Improving knowledge of crime and crime causation is an important focus for many law enforcement agencies. Many believe such knowledge can be used to predict crime and criminal behavior. *Predictive policing* is one of a variety of strategies developed by law enforcement personnel and researchers. The practice of law enforcement is frequently reactive, in nature, where police officers respond to crimes after they have been committed. In an effort to prevent future crimes, however, those with an interest in prevention have also added the strategy of proactive policing, where information and advanced analyses are added to their repertoire of approaches.

Our review consists of 24 research articles which examine predictive policing and the effects it can have on society and crime prevention. The articles come from several countries, including the United States, the United Kingdom, and Sweden and illustrate the worldwide value of predictive policing. The analysis not only focuses on the concept of the strategy, but also on how it can be used to learn more about criminal behavior, overall. For ease of reading, the review has been broken into five sections: (1) definition of predictive policing, (2) how predictive policing is used to identify and deal with victims of crime, (3) how predictive policing can be used to predict offenses and offender behavior, (4) how predictive policing is developed, who uses it, and how it is accessed; and (5) best practices for when and how predictive policing is used, as well as suggestions for how it can be utilized more efficaciously.

Definitions

An examination of the predictive policing literature resulted in 13 articles which included information on the definition of predictive policing. The technique of predictive policing was developed as new research studies and criminal justice data became more readily available to law enforcement and criminalists around the world. Such an amount of information gave rise to the notion criminal behavior could be predicted. It is a relatively new practice and involves compiling complex data from previous crimes and criminal offenders which are then entered into a sophisticated computer analysis system to predict when and where future crimes will occur (Ruben, 2010). National, regional, or even local data can easily be “plugged into” the theories’ equations to predict future criminal activity.

One approach recommends employing advanced theory and experimentation to improve law enforcement personnel’s understanding of crime. For example, situational action (SA) theory suggests criminal deeds result from an individual’s perception of the actions available to him/her. The decision to behave in a specific way may depend on the individual’s self-control and willingness to adhere to social rules. According to SA theory, individuals experiencing situational anger are more likely to engage in crime. This theory and those related to self-control propose people unable to cope with short-term events which make them angry may lash out with violence. In similar fashion, temporal patterning (TP) theory suggests some people are predisposed to crime if certain long or short-term conditions exist. Long-term conditions include such things as level of intelligence or detachment from society. Short-term conditions are those which provide immediate opportunities to commit crime, such as the presence of attractive targets, but no capable guardian (Agnew, 2011, pp.119, 131; Rebellon, Piquero, Piquero, &

Thaxton, 2009, p.64; Wikström & Svensson 2010, p.396). Analysis of prior conduct of individuals in some situations can help us understand (i.e., predict) how others with like backgrounds might behave in similar types of conditions.

Other theories focus on crime in relation to population and other characteristics of an area. Browning, et al., (2010) examined how factors, such as the ratio of residential and commercial land density, can affect crime (pp.332-336), while Cochran and Bjerregaard's research found when a population becomes well-established, it may suffer from a collective anomie, or lack of social norms, which may induce criminal behavior (2012, p.205). The economic stability of an area may also predict of criminality. Holmes, Smith, Freng, and Munoz argue governments may play roles in economic stability by denying resources for political reasons (2008, p.129).

Labeling theory also plays a role in predictive policing. This theory contends the stigma attached to an individual through police intervention may result in differential treatment from the community, which has the potential for increasing risks for further deviance (Lopes, Krohn, Lizotte, Schmidt, Vasquez, & Bernburg, 2012, pp.457-458). Kazemian (2007, p.11) found police interactions with adolescents might cause negative self-labeling, resulting in criminal behavior during later life. A negative self-image, she warns, could increase poor self-control, which is conducive to future criminal behavior. Morizot and Leblanc (2007, p.65), on the other hand, discovered no relationships between low self-image and crime involvement. They did, though, find adolescent character traits such as opposition to authority and hostility to be related to criminal behavior, suggesting negative law enforcement contacts during adolescence could increase an individual's opposition toward authority and feelings of hostility.

Analysis of increases and decreases in crime rates is sometimes used to identify patterns. Tham and VonHofer (2009, p.330) and McDowall and Loftin (2005, p.359) found the rates of violent and property crime appear strongly to correlate with opportunities to engage in crime. Additional predictive policing literature asserts an improvement in the web capabilities of police agencies would help this type of analysis immensely. This, along with greater community access to crime information and statistics, would allow for a much more sophisticated appreciation of crime (Rosenbaum, Graziano, Stephens, & Schuck, 2011, p.39).

Predicting Victims

Our literature review identified three articles where authors included information pertaining to victim characteristics (including those of people not directly victimized, such as families, friends or community members, but who can also be considered victims). We examined different types of victimization and some of the ways the impact of each type can be lessened, thanks to the ability to predict which people are likely to become victims, thereby enabling law enforcement agencies to take preventative steps.

Analysis of criminal justice data can provide law enforcement officials with general, aggregate predictions regarding groups who are more likely than others to be victims. For example, Guerette and Santana's research shows most crime victims to be Caucasian with an average age of 29. Males are more likely to be victims of robbery, while rape has predominantly affected the female population, though they caution this does not mean males are never rape victims or females are never robbed. The important aspects of having the information are knowing which

groups are more likely to be victims of specific types of crime can aid law enforcement officials in gearing specific prevention efforts toward people who are likely to be victimized (2010, pp.213, 216).

Murray, Janson, and Farrington (2007) introduce the notion that victims can also be criminals at the same time. They say adult offspring of prisoners are more likely to participate in criminal activities than are children of parents who have never been incarcerated. In cases described by their research, such an offender is viewed as a victim of his/her parent's actions because imprisonment of a parent has been shown to be a predictor of criminal activity (p.138).

In addition to providing general information about crime victims, predictive policing can also help law enforcement identify areas where crimes are likely to occur. According to Browning, et al., (2010) victimization is more liable to take place when potential victims and offenders are in an uncontrolled social environment. For example, areas with higher pedestrian traffic and busy streets, which may bring the two groups in closer proximity, are likely to increase the chances of victimization. The researchers also found commercial and residential densities both have positive and negative effects on homicide rates. They recommend a better understanding of which factors influence chances of victimization in order to improve personal safety (pp.343, 346, 347).

Predicting Offenders

We found nine articles where authors included information pertaining to offenders or factors related to criminal behavior. By employing a predictive policing approach to understand the factors which may lead to criminal behavior, law enforcement personnel may be able to prevent some individuals from offending.

Among risk factors for criminality, family history has been shown to play an important role. As mentioned in the victims section above, Murray, et al., (2007) found parental incarceration is predictive of higher rates of chronic offending. It factor remains a predictive factor even in cases where children have been separated from their parents (pp.137-138). In comparing data from Sweden and the United Kingdom, they also learned the length of parental incarceration has an effect. Children in Sweden were affected less than on those from the U.K, which they suggest may be due to shorter criminal sentences in Sweden, minimizing the family disruption (and thereby negative effects on offspring) caused by parental incarceration (p.146).

Much the same as parental incarceration, other environmental factors related to family also impact on crime. Tham and VonHofer (2009, pp.321-322) and Lopes, et al. (2012) found divorce of one's parents during childhood is predictive of future criminality and offenders between the ages of 15 and 17 to have high rates of serious family conflict. They also learned individuals convicted as juveniles are more likely to commit crimes as adults.

In addition to family history, a person's self-control has been strongly correlated to the ability to abstain from criminal activity. There may be many reasons for an individual's lack of self-control: Substance abuse has been strongly correlated with lack of self-control and spontaneous crimes may occur as a result of brief periods of reduced self-control due to intoxication (Agnew, 2011, p.128; Wikström, 2010; Ribeaud & Eisner, 2006, p.33). Agnew also mentions diminished mental capacity as correlating with lowered levels of self-control and higher risk for criminal

activity when an individual is exposed to a new environment (2011, p.128). Rebellon, et al., found anger, which can significantly affect self-control, appreciably increases the risk of criminal behavior (2009, p.64).

In addition to environmental risk factors affecting offenders, some community-level factors can also encourage or dissuade potential offenders. If one assumes offenders are rational (which is controversial, in and of itself), one might predict potential offenders will select targets based on perceptions of greater rewards and smaller risks. Thomas (2011, pp.382-385) and Agnew (2012, p.34) contend communities with high levels of social disorganization tend to have lower levels of self-monitoring (e.g., neighborhood patrols; neighbors watching out for each other and their property; etc.), which may increase opportunities for criminal activities. They further suggest areas with higher natural surveillance may serve to reduce the risk of crime and use these examples: (1) increased poverty can cause people to spend more time at home, potentially leaving fewer attractive targets for offenders; (2) weather can also be used to predict offender behavior, as certain crimes increase in warmer weather, possibly due to more homes being left more vulnerable through open doors and windows or vacationing families.

It is important to remember similar situations may have divergent outcomes (O'Mahony, 2009, p.100). While there are a variety of factors which could help predict offender behavior, every factor may not be applicable for individual situations. Taken together, however, the factors may help identify potential situations in which there are increased risks for criminal activities to occur and inform police personnel, allowing them better to distribute officers and other resources where most likely to be required.

Prediction Utilizing *Modus Operandi*

We read five articles where authors included information pertaining to an offender's *modus operandi*. The word, *modus operandi* (*M.O.*) is synonymous with "method of operation" and refers to particular habits or practices used by offenders when committing crimes. Analyzing an *M.O.* involves observing similarities and re-occurring actions across several crimes, then examining them to identify patterns which may identify an individual offender. The technique of documenting offenders' criminal actions is most helpful when endeavoring to apprehend serial offenders by establishing links connecting particular individuals to several crimes. The most effective way to achieve this is through recovery of forensic evidence, such as DNA material or fingerprints left at the scene, when it is available. A second method of establishing an *M.O.* is through "behavioral linkage," which involves documenting distinctive behavior (e.g., using a deposit slip on which to write a note to a bank teller in a robbery) exhibited by an offender, which may him/her distinct from others (Tonkin, Woodhams, Bond, & Palmer, 2011, p.1070).

Chen (2008) found that when incarcerated serial offenders are eventually released, they often recidivate, engaging in the same crimes, using the same methods as before their sentences. Offenders targeted by "three strikes" laws are examples of offenders with *M.O.s*, as they are habitual in their methods and are often arrested for the same crimes as those for which they were previously incarcerated. In California approximately 100,000 offenders have been sentenced under the tough three strikes law, yet the effect on California's crime rate is not better than states with more lenient laws. Nationwide data indicate, however, three strikes laws are associated with declines in robbery, burglary, and theft, nationwide. The same research suggests it is

possible a repeat offender might alter his/her *M.O.* to avoid arrest and charges under a three strikes law. The change might include moving to other, less serious, crimes not subject to such prosecution, or simply retiring from crime (pp.353, 357, 362).

Society also plays a role in the lives of offenders and their methods of operation. Sprawling urban areas tend to attract more property crimes, aggravated assaults, and homicides due, it is theorized, to the lack of community cohesion, urban decay, and the presence of economically disadvantaged neighborhoods. In addition, with densely populated areas it is less likely individuals know each other, even if they are neighbors. It is also less likely individuals are willing to contact police over suspicious behavior in the neighborhood because they do not know their neighbors and may fear retaliation. This state of affairs enables offenders - even those with known methods of operation - to engage in criminal activities with little fear of a police response. Densely populated areas are also experiencing a rise in hate crimes, especially against immigrant populations. In the last decade, changes in New York City's minority population have resulted in higher rates of hate crimes, particularly against Hispanics living in predominantly white neighborhoods. Law enforcement personnel may use information, such as this to predict common elements of the *M.O.s* of offenders who target specific groups of people and may use geographic demographics to predict where future crimes will occur (Browning, et al., 2010, pp.330-332; Stacey, Carbone-Lopez, & Rosenfeld, 2011, p.283).

There are also rare occasions when offenders cease their criminal activities before authorities can use their *M.O.s* to identify them. Such instances occur when individuals engage in short-term deviations from lawful behavior, often be seen with juveniles and young adults who give into peer pressure and commit crimes, then are able to resist it as they mature (Agnew, 2011, p.123).

Best Practices for Predictive Policing

Best practices should focus on the specific ways particular problems can be solved. We utilized five articles where authors included information pertaining to predictive policing strategies and learned there are several key elements to take into account. These include when and why an event may be occurring, how a particular issue may be addressed, and which crime prevention approaches might be better suited for a specific place or group of people.

For example, if focusing on preventing criminal behaviors frequently perpetrated by gang members, location rejection approaches, where resource allocation is vital in directing efforts toward a group of offenders or a particular problem, might be deployed (Taniguchi, Ratcliffe & Taylor, 2011, p.351).

Another example of using predictive policing in crime prevention is with the use of CCTV. Research suggests CCTV provides an objective account of offenses and assists police in the identification and apprehension of offenders. It also enhances the credibility of arrest reports because CCTV images are akin to an uninvolved bystander or witness and could be considered a "best practice" to deter crime in certain areas and predict it in others. It might even be said the absence of CCTV would be a good predictor variable in where crimes are likely to occur. We say this because it is known offenders commit crimes when potential rewards outweigh the risks. Bystanders (the presence of witnesses) increase risks for potential offenders, which may deter unlawful behavior. The presence of bystanders increases the probability crimes will be

interrupted, which may lead to the identification of the offenders and apprehension. CCTV essentially assumes the role of a bystander by discouraging an offender from committing a crime and/or serving as an objective witness to crimes (Lippert & Wilkinson, 2010, p.140; Guerette, & Santana, 2010, p.220).

Vigilance is crucial to self-protection and preventing crime through prediction. Rosenbaum, et al. (2011, p.39) suggest communication between criminal justice agencies and the public via the internet is an important predictive policing measure. It is an effective way for police agencies to use available technology, demonstrate transparency, respond to community demands, and elicit crime information. It can also be used to share crime prevention models, publish crime maps, and crime statistics. Studies suggest that physical distance between crimes and lengths of time between occurrences can indicate a common offender pattern, which makes the online publication of current crime maps and statistics a valuable tool for citizens who wish to employ prevention measures. The goal is to have best practices which are able to predict, with high degrees of accuracy, most potential types of crime problems (Tonkin et al., 2011, p.1070).

Conclusion

It is part of criminologists' responsibilities to explore multiple factors with the potential to influence crime and criminal involvement. Predictive policing, one of the most recent policing methods, is a technique permitting the prediction of crimes and criminal behaviors. As discussed in previous sections, factors linked to criminal activities vary from climate changes (Agnew, 2012, p.22), to social standing and family history (Stacey et al., 2011, p.279), and situational anger (Rebellon et al., 2009, pp.64-65). Other significant predictors of crime involve family history of crime and incarceration (Murray et. al., 2007, pp.137-138), and divorce (Tham & VonHofer, 2009, p.321). Risk factors, such as those mentioned, tend to put some people at increased risk for lower self-control and to make them more susceptible to committing crimes. In addition to understanding offenders and their behaviors, it is imperative to understand victims, as well. Victims can unwittingly put themselves in harm's way through their behaviors and actions. Uncontrolled factors, such as race also impact crime rates and crimes motivated by race are occurring with more regularity (Stacey et al., 2011, p.285).

Ever-evolving technological advances such as fingerprinting and DNA techniques, are highly beneficial in prosecuting crimes and help predict them, as well. Knowing where and how to look for evidence could significantly aid law enforcement officers, when there are better understandings of offenders' behaviors and how they might commit their crimes. Predictive policing does just that, by identifying characteristics which forecast future criminal activities and may even prevent some crimes from occurring.

In an effort to get the most out of predictive policing, law enforcement personnel must be trained in handling many different types of situations. The predictive policing approach does not encourage or promote racial profiling. Empirical evidence is examined instead, which allows for police presence to be allocated in areas most likely to have higher rates of crime, not based on certain ethnic populations. Better allocation of police presence can permit a closer watch on high risk individuals and communities. The increase of police presence in these known locations has the potential to affect the level of criminal activity and to reduce the risk of victimization to society (Thomas, 2011, pp.384-385).

Our analysis of more than 20 articles reveals some important benefits of predictive policing. Because of the relative newness of the technique, future research is needed to focus on the advantages and disadvantages of the approach to policing. Because it concentrates on projection, it not only works for active police work but allows for proactivity and prevention strategies, too.

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